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# THE ONTARIO METAL MINING INDUSTRY

## —Present and Future

A discussion paper prepared by  
the Mineral Resources Branch,  
Division of Mines, Ministry of  
Natural Resources. February 1977

NOTE: The opinions expressed herein are not  
necessarily the viewpoint of the Government  
of Ontario



## FOREWORD

This paper has been prepared by the staff of the Ministry of Natural Resources, Mineral Resources Branch, as background for public discussion by interested persons of the problems faced by the metal mining industry in the Province of Ontario.

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## THE ONTARIO METAL MINING INDUSTRY - PRESENT AND FUTURE

### 1. INTRODUCTION

For many years, the Ontario metal mining industry played an important pioneering role in the development of Ontario, especially the northern part of the Province, and it was generally accepted that the rewards of mining success should be high, as befitted the business risks taken. Federal and provincial tax policies were consequently designed to provide substantial incentives to mining investment.

During the late nineteen-sixties, however, the public and governmental perception of the industry gradually changed. While it was conceded that the incentives to mining exploration and development had worked well, it was believed that the industry had progressed to the point where these incentives could be largely eliminated without seriously affecting future industry growth. It was also believed in some circles that government policy should be to divert capital investment from primary industries, such as mining, to manufacturing and service industries where, it was claimed, more jobs would be created, and more taxes would be received by government, for the money invested.

This is a highly questionable thesis but, as a result of these changed perceptions, federal tax incentives designed specifically to encourage mining investment were almost completely eliminated in the federal tax reforms which took effect in January 1972. This date marked the beginning of a new era in which the Ontario metal mining industry would be required to function under conditions substantially altered from those which obtained in the previous several decades.

In 1974, the Government of Ontario increased its mining tax in order to obtain for the Province a larger share of the revenues from mineral resource development. Industry and government standards relating to environmental protection and worker safety and health began to be raised in the same period and screening of foreign investment in Canadian mining by the federal Foreign Investment Review Agency commenced.

Events since 1974 have made earlier estimates of growth in world metal demand seem overly optimistic. However, considerable new production capacity was built based on those estimates, much of it in countries having lower labour costs and lower environmental standards than Canada. Competition from these new and augmented sources of supply can be expected to be very strong.



In this paper, it is intended to survey briefly the state of the Ontario metal mining industry after several years of operation under new conditions. Problems which have arisen, and some possible solutions, are described in the hope that necessary corrective action can thereby be expedited. In some areas, such action is urgently needed. The paper has been prepared by the staff of the Mineral Resources Branch, Ministry of Natural Resources, as a basis for discussion. It should not be considered as necessarily expressing the viewpoint of the Government of Ontario.

The paper is intended to be non-technical and use of graphs and tables of statistics has been avoided. Where figures are necessary, five year averages are frequently used. The main reason is that markets for metals are usually cyclical in nature with prices and quantities sold varying from low to high and back again over a period of several years. Comparisons between any two years may therefore be badly misleading since they may not indicate the true long term trends. The mining industry must rely on its earnings from the good years to carry it through parts of the cycle when metal prices and sales are low, so it is the average figure over several years that is most significant to industry and government. For example, neither the good year of 1974 nor the recession year of 1975 can alone be taken as representative of the recent past of the industry. Study of past records shows that a minimum of four or five years is needed to cover a complete cycle. Many of the comparisons in this paper are therefore made between the last five years of the period before federal tax changes (1967-71) and the first five years after the changes (1972-76). Where earlier long term trends are of interest, averages from the 1951-55 period are compared with the 1967-71 figures.

An additional reason for using five year averages is that Statistics Canada figures give metal deliveries to customers in a given year and not metal production. Deliveries normally fluctuate much more than production as some producers stockpile part of their output during years of poor sales and use up their stockpiles in the good years. An average over a number of years therefore gives a more realistic production figure for comparison purposes. Labour disputes may also halt production and result in abnormal figures for a single year but they have much less effect on five year averages.



All metal prices mentioned in this paper are in Canadian dollars. It should be noted, however, that most Canadian metal production is sold for United States dollars. The rate of exchange between the Canadian and U.S. dollar is therefore of great significance to the Ontario metal mining industry. For example, a high value for the Canadian dollar relative to the U.S. dollar results in lower Canadian dollar receipts for a given amount of metal sold.

In many cases, it is important, when making comparisons between different years, to allow for the effect of inflation. This has been done by converting current dollar values for each year into the equivalent in 1971 dollars using the Gross National Expenditure Implicit Price Index. According to this index, for example, goods and services costing \$1.00 in 1971 would have cost \$1.45 in 1975. Other indices published by Statistics Canada could also reasonably be used for the mining industry and would give slightly different answers. These differences are not, however, large enough to cause the conclusions drawn on the following pages to be materially changed.

More than 97% of the value of Ontario metallic mineral production is derived from sales of nickel, copper, zinc, iron, uranium, gold, silver and platinum group metals. Only these metals are therefore discussed in detail in this paper.



## 2. SUMMARY OF THE CURRENT SITUATION

The Ontario metal mining industry provides jobs for about 40,000 people directly and for many more indirectly. It provides essential raw materials for other Ontario industries and plays a major role in developing northern Ontario. It has been argued that, if the mining industry were allowed to decline, surplus employees and capital could be transferred to manufacturing and a smaller mining industry could still supply enough raw materials for domestic needs. Such arguments, however, do not take account of the fact that metallic mineral products account for about 20% of the total annual value of exports from Ontario.

If the standard of living in Ontario is to be maintained and improved, the level of exports must be maintained in order that needed imports can be paid for. A reduction in exports of minerals would have to be balanced by an increase of other exports. These would presumably be primarily manufactured goods. Unfortunately, the Ontario manufacturing industry is, for the most part, not well able to compete in world markets due to such disadvantages as a small and dispersed Canadian market and high labour costs.

For a correct perception of the role of mining in Ontario economy, three further factors need to be considered. Incentives are provided to domestic manufacturing through a variety of federal and provincial programs in the area of taxation, regional economic expansion, technological research, manpower training, etc., which may be considered the equivalent of the incentives to mineral sector development referred to earlier. In addition, most Ontario manufacturing enjoys high levels of tariff protection against import competition. Mining does not enjoy, and never has enjoyed, such protection against the rigors of the market place. Lastly, value added per person employed has been consistently higher in mining than in manufacturing. To the extent that policies force a shift of employment from mining to manufacturing at a rate or in a pattern different from what the market indicates, jobs would be shifted from areas of higher to areas of lower value productivity, to the ultimate disadvantage of the provincial standard of living.



In these circumstances, it appears that for the foreseeable future a large and healthy metal mining industry will be an essential contributor to Ontario's material well-being. Public policy should be to encourage development of those sectors, such as mineral production, where Ontario has a natural advantage. In a free enterprise economy, this means that investment in mining has to be made attractive. The attractiveness of an investment depends on the anticipated relationship between revenues and costs and on the degree of risk and uncertainty involved.

About 90% by value of the output of the Ontario metal mining industry is exported, thus the revenues of the industry are greatly dependent on the state of the world metal market. A large number of sellers of metals and a large number of buyers operate in this market and no one company, commodity association or country can control it. Ontario producers must compete in a climate in which prices are decided by the relationship of supply to demand at any particular time.

Generally, world metal prices are currently low and short-term increases cannot be ruled out. For most metals, however, there is no evidence to indicate that long-term prices in terms of constant dollars will be much higher than in the past. In some cases the possibilities for substitution, such as the use of aluminium instead of copper, act as a restraining influence on price increases. In others, for example, iron, copper and silver, substantial quantities of scrap are available and come onto the market when prices rise. This also has a restraining effect.

Expansion of world production capacity for several metals of importance to Ontario, notably nickel and copper, was until about 1974 based on estimates of growth in world demand which today seem overly optimistic. The excess capacity and surface stockpiles of metals which now exist will result in strong competition among producers of these metals and will tend to keep prices down until the gradually increasing demand catches up with supply. The over-supply may be increased by export-oriented expansions in communist countries and, in the case of nickel, by sea-bed mining in the next few years. There is therefore no reason to assume that investment in most sectors of the mining industry will be made more attractive due to an increase in revenues. However, the present situation can also be improved by reduction of costs and risks, and governmental action can be helpful.



One source of cost reductions is improved mining and mineral processing technology. The record of the Ontario metal mining industry in this respect is good and its output per employee is among the highest in the world. As productivity improves, however, it becomes more difficult to devise further improvements. No important new improvements in productivity can be foreseen at this time.

A second method of cost reduction for the mining industry would be a reduction in the burdens imposed on the industry by governments. In this paper, taxes are considered as part of costs. The normal risks and uncertainties of mining, such as unexpected changes in geological or market conditions, are inherent in the business but new uncertainties have been added in recent years. These uncertainties governments could help to mitigate. These subjects will be discussed in more detail on the following pages. For the moment, the situation can be summarized by the statement that the three vital factors which decide the attractiveness of mining investment are anticipated revenues, costs and risks. Certain costs and risks resulting from government policies at the federal and provincial levels are the only items that can readily be changed for the better.

An important "early warning" indication of the health of the metal mining industry in Ontario is the level of exploration activity in the Province. Since the first step in any new mining investment is usually an exploration program, vigorous exploration promises future investment in new mines and a healthy industry. Conversely, the first sign that industry no longer finds investment opportunities attractive is likely to be a cut back in its exploration budget. According to this indicator, Ontario mining can anticipate a continuing decline.

Average general exploration expenditures in Ontario during the 1972-76 period were about \$20 million per year compared with \$22 million in the 1967-71 period. General exploration expenditures are defined as expenditures other than those incurred on producing properties or properties being prepared for production. They represent money spent on the search for new orebodies away from existing mines and not money spent on exploration to gain more information on orebodies already discovered. Even more significant than the current dollar averages quoted above are the corresponding figures in constant 1971 dollars. These give a better measure of the actual amount of work done and are \$15 million per year for 1972-76 compared with \$23 million for 1967-71. No discover in Ontario leading to probable new mine construction has been made since 1971.



Suggestions have been made that this decline in exploration activity in Ontario is due to the 1975-76 recession and that better times will see a resumption of former trends. This view is not supported by a study of the individual figures for 1972-76 which are:

Year	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>
Exploration expenditures (millions of constant 1971 dollars)	14.5	16.3	15.1	15.7	14.2*

Thus at no time in recent years has the 1967-71 level of \$23 million been approached, in spite of the fact that 1974, for example, was a good year for Ontario mineral production.

Another suggestion has been that the exploration decline is due to the increasing difficulty of finding mines in Ontario as the more easily discovered orebodies have now all been found. This ignores the fact that exploration costs are only a small part of total mining costs so that, if the overall mining investment possibilities are attractive, money for exploration will be found. Discovery costs per mine exhibited an upward trend for at least the last 25 years but until 1971 exploration expenditures rose to compensate for this.

The problems facing the Ontario industry, which are leading to a lack of interest in mining investment, are as follows:

i) Uncertainty as to future government policies.

The federal and provincial policies affecting mining in Ontario have been considerably revised over the years since 1972. Until the situation stabilizes, advance planning by industry is difficult and there is a tendency to adopt a "wait and see" attitude. On the federal level, business concern over stability is aggravated by remarks by Cabinet ministers, as well as other government spokesmen, about their determination to restructure society. Such political uncertainty demands of a company considering investment in the mineral sector that it consider only prospects for which expected rates of return are higher and pay-back periods shorter than would be the case if only the ordinary business risks of mineral investment had to be taken into account.

\* The 1976 figure is an estimate based on diamond drilling and claim staking reports.



ii) Shortage of capital.

The expected rate of return on investment in mining projects in Ontario has been reduced by changed federal and provincial taxation policies to the point where some investment funds are being diverted to other industries and countries offering more attractive investment possibilities. Increased taxation has also reduced the funds available for re-investment in plant expansion. Canadians are apparently willing to provide only a small part of the risk capital needed to maintain and expand mining activity in Canada yet foreign capital investment is discouraged by federal foreign investment review and uranium ownership policies.

iii) Inflation.

Construction costs of new mines in Ontario have escalated at an even greater rate than have business costs in general in recent years. Replacement and repair costs for existing plants have increased in a similar manner and have diverted funds from new construction. High inflation has resulted in profits which exist only on paper but which are subject to taxation. For example, allowed deductions from taxable earnings to cover replacement costs of plants and equipment are inadequate due to inflated replacement costs.

iv) Energy costs.

In common with all other segments of Ontario industry, the mining industry is suffering from sharply increased energy costs of which the recent 30% boost by Ontario Hydro is only one example. This is yet another component of ever-increasing production costs, but a very significant one.

v) Marketing difficulties due to intensified foreign competition.

The likelihood of intensified foreign competition, discussed earlier in these notes, discourages investment in new mining capacity in Ontario at this time. For example, excess copper production capacity exists in such third-world countries as Zambia, Zaire and Chile. They cannot afford to cut back production, in spite of the over-supply of copper, due to their need for hard currency foreign exchange, and the necessity to maintain employment. They must produce and sell copper whatever the price.



vi) Shortage of Labour.

A chronic labour shortage and high turnover in northern Ontario mining hinders mineral production, yet at the same time Ministry of Labour statistics show that the highest local unemployment rates in Ontario are in the north. The female participation rates in the work force in that area are relatively low so that there should be a considerable number of men seeking work. Clearly, this apparent paradox needs early investigation. If the statistics are realistic, then perhaps local training programs are needed. If they are not realistic, then alternative sources of labour must be found. Unemployment exists in southern Ontario but unemployed southerners show little inclination to move north and, in an age of liberal unemployment insurance and other programs, there is little economic incentive for them to do so. The younger potential employees have higher expectations than their predecessors and frequently are reluctant to apply for jobs which they expect to be arduous and repetitious and which involve living away from the large cities (even though, in fact, many interesting careers exist in mining and many northerners would not choose to live in Toronto!). At the same time that young Canadians choose not to seek employment in northern mining, immigration of foreign labour with mining skills is prevented on the grounds that unemployment exists. One possible solution to this dilemma may be to raise wages, training opportunities, working and living conditions in northern mining areas to the point where labour can be attracted. If this is to be done and the mines are to remain competitive in world markets, they must be highly mechanized and efficient. This in turn requires high capital investment. This difficulty might, however, be reduced by increase of "take home pay" through reduction of personal tax rates of northern area residents.

vii) Time loss due to increased regulation.

Increased regulation of the mining industry, in such matters as extensive pre-production environmental hearings, while necessary, tends to discourage initiation of a project and may lead to costly delays.

viii) Increased environmental constraints.

Higher environmental standards than were considered adequate in former times are recognized as desirable and probably necessary but they do contribute to higher costs for industry and make investment less attractive. Higher costs may render a mine uneconomic or force miners to leave behind areas of low grade material that cannot yield enough revenue to cover the increased costs of mining.



ix) Unsuitable environmental and housing standards.

Certain standards appear to have been established with the urban areas of southern Ontario in mind and are often not applicable to northern conditions. In some cases, use of province-wide standards based on urban needs may be unnecessarily expensive.

In recent years, extensive debates have taken place between representatives of the junior mining exploration industry and the Ontario Securities Commission in regard to OSC regulatory policies covering junior mine financing. The junior mining companies are those which obtain their exploration funds from sales of shares to the general public. Major companies finance exploration from the revenues from their producing mines. Disagreements over the regulatory policies have been the subject of a separate study and proposals for a solution to the problem have recently been made. It is expected that, in the future, any problems connected with OSC policies will be minor compared with those listed above.

The major problems described above are formidable but government action can be taken to solve enough of them to ensure that the Ontario metal mining industry remains healthy and able to play its essential role in the economy of the Province. Some possible courses of action for the Government of Ontario are outlined in a later part of this paper.

The Government of Ontario does, of course, already provide millions of dollars per year for active support of the mining industry in a number of significant ways. These include:

- geological mapping and research, which by providing basic data considerably reduces industry exploration costs
- the Mineral Exploration Assistance Program under which direct grants are made to companies exploring in designated areas
- tax incentives for establishment of further processing plants in Ontario
- road construction to new mining areas
- assistance in the provision of services for new mining communities, and
- technical advice from the professional staff of the Ministry of Natural Resources and other ministries.



It must be emphasized, however, that the existing Government support for the mining industry, and any increased support on similar lines, will be largely ineffective unless investment in mining is made attractive. It might also be stated that, if Canadian ownership of the Canadian mining industry is to be the aim, then ordinary Canadians must be given the incentive to save and invest. A suitable investment climate ought to be a matter of concern to a much wider group than bankers and mining company financial planners.



### 3. CONCLUSIONS

- a) The level of future investment in the Ontario metal mining industry will continue to be decided by expected rates of return and anticipated relative risks in comparison with those of other countries and industries. The three key elements remain expected revenues, costs and risks.
- b) Since revenues from metal sales are mostly beyond Ontario control , governmental policy can only be directed at reduction of costs and risks.
- c) The present lack of interest in mineral exploration in Ontario is mainly due to the uncompetitive expected rates of return on the capital required to bring a discovery into production. This is a factor more important than all others combined.
- d) Government investment in exploration, directly or through further tax incentives, is not in itself a total solution, although it is helpful. With an adequate return, such measures will not be needed; without it, they will be ineffective.
- e) The maximum benefit from mineral policies, both federal and provincial, would appear to result if they remain relatively stable.
- f) Mineral policy does not and cannot exist in a vacuum. Even the best mineral policy can only be effective, that is assure the continued health of the mineral sector, if there is some measure of coordination between it and policies in other areas of concern. This requires the introduction of the concept of policy accountability of every policy-making unit for the effects of its proposals on the areas of responsibility of other such units. In this way, the inevitable trade-offs between various conflicting requirements can be made in an intelligent fashion.



#### 4. POSSIBLE COURSES OF ACTION

The problems facing the Ontario mining industry can be divided into three categories. These are:

- (a) Problems in regard to which the Government of Ontario can act alone, such as environmental costs, regulatory delays and provincial taxes. (As mentioned earlier, Government action can only be directed towards reducing costs, risks and uncertainties. Revenues are mostly beyond Canadian control.)

Possible courses of action relating to this category are:

- (i) Revise provincial taxes on mining to make the expected rate of return obtainable more attractive in comparison with that offered by alternative investment possibilities.
  - (ii) Provide tax incentives for workers in remote communities and/or essential industries.
  - (iii) Reduce, to the minimum possible level, uncertainties regarding the provincial position on ownership controls, environmental standards, and similar regulatory matters.
  - (iv) Design environmental and housing standards to suit the needs of remote mining communities.
  - (v) Streamline procedures for coordination of new resource developments so that necessary governmental approvals, infrastructures, etc. are obtained with minimum confusion and delay.
  - (vi) Investigate the apparent contradiction of a mining labour shortage in areas of Ontario having high unemployment figures.
- (b) Problems in regard to which the Government of Ontario can only seek to influence the federal attitude, such as federal taxation and ownership rules.



Possible courses of action by Ontario relating to this category are:

- (i) Review effects of federal taxes on mining and make proposals to the Government of Canada regarding the most suitable combination of federal and provincial taxation.
  - (ii) Suggest the provision of federal tax incentives for workers in remote communities and/or essential industries.
  - (iii) Recommend that the federal government restore capital gains tax exemption for prospectors, or include provisions for 10 year averaging of income.
  - (iv) Ask for consideration of removal of AIB controls on wages and profits in remote mining communities.
  - (v) Seek reduction, to the minimum possible level, of uncertainties due to proposed or existing federal ownership controls, environmental standards, etc.
  - (vi) Continuously monitor foreign investment rules, uranium ownership rules and similar restrictions to ascertain whether their continued existence does in fact produce a net benefit for Ontario and Canada.
  - (vii) Propose the re-invigoration of the presently ineffective Canadian Ministerial Conference on Mineral Policy, or its replacement by a more effective means of providing for federal-provincial coordination of mineral policy (such as regular joint reviews on a bilateral basis by the governments of Ontario and Canada).
- (c) Problems over which the governments of Ontario and Canada have no control such as commodity prices and world wide cyclical movements.

No action is possible in this case.



## 5. THE BACKGROUND

### a) Sources and Use of Data

The aggregated statistical data quoted in this paper have been obtained from Statistics Canada and Ontario Statistical Centre reports, from the technical literature and from company returns to the Ministry of Natural Resources. The amount of data has been limited to the minimum necessary to clarify the subject under discussion but, even so, one significant point must be stressed.

A common problem in studies of this type is that the mining industry is so complex that exact figures on some aspects are impossible to obtain. For example, a mining company may have a manufacturing subsidiary and consequently an inaccuracy is introduced if the company is categorized for comparison purposes as wholly mining. Metal sales may not always be at exactly the published producer or metal exchange prices. Statistics Canada does not make allowance for foreign refining charges on metals exported in unrefined form so that the net income to an Ontario producer may be somewhat less than the calculated figure.

In spite of such inaccuracies, the statistical information is useful, especially as its main purpose in this paper is to illustrate trends from one period to another. Most inaccuracies are consistently in the same direction from year to year so that the trends shown are reliable even though the figures themselves could be in error by as much as 20%. Care has been taken to avoid quotation of statistics having possible errors so large that reliable conclusions cannot be drawn from the quoted figures. Care must be taken, however, in using the figures for purposes other than those for which they were intended.

### b) The Importance of Mining to Ontario

The Ontario metal mining industry produces directly about 3-4% of the Gross Provincial Product. In addition, it provides essential raw materials for other major sectors of Ontario industry and is an important customer for the products of other sectors.



Mining has a particularly important role in making Ontario a relatively rich province since about 20% of Ontario exports are mineral products.

The mining industry employs directly about 29,000 employees working in mines and concentrators and a further 12,000 employed in smelters and refineries. A wide variety of trade and professional skills is needed for efficient operation of the industry so that many worthwhile career opportunities for Ontario residents result from its existence. Additional employment is generated in industries closely related to mining such as machinery manufacturing, material supply and services.

Mining has been a major pioneering industry in developing northern Ontario.

Ontario produces about 40% by value of total Canadian metallic mineral production or 20% of total Canadian mineral production, including industrial minerals, oil and gas.

The total value of Ontario metallic mineral production continues to have an upward trend even after adjustments to allow for inflation. The average annual value for the 1967-71 period was \$1.25 billion in 1971 dollars. The corresponding figure for 1972-76 was about \$1.44 billion.

### (c) General Trends in Ontario Mining 1967-76

In the technical sphere, the last ten years have seen the continuation of trends that developed in earlier decades. The initial change was a gradual reduction in the percentage of the industry that was engaged in mining precious metals as the main products. The value of gold and silver production from such mining averaged 22% of the total provincial metallic mineral production in the years 1951-55 inclusive but for 1967-71 was only 7% and for 1972-76 only about 5%

The average size of mines has increased. Even twenty years ago, mines producing 300 to 1,500 tons of ore per day were considered to be large while today, in most cases, 4,000 tons per day plants are considered to be an economic minimum. The capital investment in the equipment used by a miner has increased from a few hundred, or at most a few thousand, dollars to between \$20,000 and \$100,000 depending on the mining methods used. Mining methods themselves have changed, with much of the technology originally developed for open pit mining now being used underground.



The size and complexity of the concentrating plants, in which valuable metal is separated from waste rock, has increased. This, plus increased labour costs, has led to extensive automation. Such changes result in increased capital requirements and longer lead times from discovery of an ore deposit to production.

Labour shortages in northern mining areas have continued, especially in the skilled trades, as employment opportunities for such people in southern urban centres have improved. The level of transfer payments, such as unemployment insurance and welfare, has increased throughout Canada reducing the incentive, even for unskilled unemployed, to seek work in the north. Younger potential employees are reluctant to apply for jobs which they expect, not necessarily accurately, to be arduous and repetitious and which involve living away from the large cities. Adverse publicity regarding pollution and health hazards and the relative lack of publicity given to less dramatic positive achievements have given potential employees an unbalanced view of mining. Immigration of skilled mining men has fallen off due partly to increased prosperity in Europe and partly to immigration restrictions based on unemployment levels in southern communities.

In the economic sphere, the last ten years have seen a dramatic change. Until the end of 1971, the Ontario mining industry faced the normal hazards of competition in a world market but prospered and expanded. Taxation was such that the average return on mining investment made such investment attractive in comparison with other possibilities. The federal tax changes at the start of 1972 marked the end of this era and in the period of 1972-76 exploration expenditures in Ontario fell sharply. This was the first sign of reduced interest in mining investment in the Province.

#### d) Investment Climate

The single most important factor in an investment decision is the expected rate of return, after taxes, on capital compared to investment opportunities in other business sectors or countries. When comparing expected rates of return, the different amounts of risk and uncertainty associated with the various opportunities are taken into account with a high risk project requiring a high rate of return to make it attractive.



For a major new mine, the capital requirements may now be more than 250 million dollars. This is double the figure of even five years ago. Such amounts of capital are not available from Canadian investors alone and part must be raised in the United States or northern European money markets. The standing of Canada in these markets is therefore a matter of great significance.

Until recent years, a combination of a stable political climate and realistic tax policies made Canada an attractive country for mining investment. The faith of investors in Canadian attitudes towards investment, especially foreign investment, has, however, recently been shaken by the actions of some provincial governments and by certain federal policies. These policies, leading to the creation of such institutions as the Foreign Investment Review Agency and the Anti-Inflation Board, may be well-intentioned and justified but they also denote a change of Canadian attitudes and imply increased risks and uncertainties for investors. Even if these increased risks and uncertainties are more imagined than real, Canada's image as a country needing and welcoming foreign investment has been changed. The extra uncertainties, combined with a reduced anticipated rate of return due to taxation changes, etc. have reduced the attractiveness of Canadian mining to the point where several major Canadian mining companies are making their largest new investments outside Canada.

Factors favouring new investments in selected foreign mineral developments, which will eventually compete with Canadian mines, are (i) expected faster recovery of initial capital, (ii) lower construction costs, (iii) opportunities for better access to more markets, (iv) relative labour peace, and (v) low labour costs. Obviously, a good deal of care has to be taken to select a foreign country where drastic changes of government are infrequent!

In addition to being diverted abroad, potential Canadian mining investment may be re-directed to alternative domestic investment opportunities. The reasons for such diversion are not difficult to find. From Statistics Canada figures it can be calculated that the average return on shareholder's equity in Canadian metal mining for the period 1967-71 was about 12.5% against an average of about 9% for the total manufacturing industry. At that time, a completely safe investment such as Canada Government Bonds would have brought a return of about 7%. In such circumstances, investment in the riskier ventures was encouraged by the higher rate of return. The corresponding figures for 1974-76 are about 11.5% return for metal mining, 14% for total manufacturing and about 10% for safe investments. Note that, because of inflation, the attractiveness of all these 1974-76 figures is an illusion. The important point, however, is that an average mining investment now offers no better a return than a manufacturing investment and very little better than a completely safe one. In these circumstances, investment in riskier ventures seems much less worthwhile.



Studies now in progress in the Mineral Resources Branch indicate that the changes at the federal and provincial levels in both the tax and environmental regimes have led to mineral investment substantially lower than it would have been had the pre-1972 tax and environmental regimes in Canada prevailed.

e) Nickel

Ontario nickel deliveries fluctuate considerably from year to year according to the demands of the market. The overall trend until about 1971 was gradually upwards. Thus Statistics Canada records indicate an average annual shipment in the years 1951-55 of 297 million pounds of nickel while in the first of the periods now under review, 1967-71, the average annual shipment was 410 million pounds. In the period 1972-76, the average Ontario shipment remained almost unchanged at about 420 million pounds. This last figure may prove to be slightly in error as only estimates for 1976 are yet available. It seems, however, that Ontario production has levelled off at just over 400 million pounds per year with stockpiles being used to absorb unsold production in recession years such as 1975.

From Statistics Canada data on quantity and overall value of nickel shipments, a rough figure for the average sale value of a pound of nickel can be calculated. This was, in dollars of the period, about \$1.11 per pound in 1967-71 and about \$1.74 in the 1972-76 period. More significant, however, is the comparison in constant (1971) dollars. This is \$1.18 in 1967-71 and about \$1.31 in 1972-76. The constant dollar value of a pound of nickel therefore increased by about 11%.

The Ontario nickel industry is the world's largest nickel production complex and Ontario's largest mineral producer. It is suffering from a massive accumulation of inventory of finished metal as a result of the recent recession and of lower than anticipated rates of growth of consumption in major markets. Unless the markets improve rapidly in the near future, it is difficult to see how cuts in Sudbury mine output can be avoided.

A higher and higher proportion of world nickel production is shifting to developing nations that enable industry to recover investment in a shorter time. The new nickel projects in Guatemala, Indonesia, Philippines, Botswana, Queensland, and elsewhere now coming into production must sell nickel at any price, if only because of the rigid loan repayment schedules of these ventures, which cost hundreds of millions of dollars each.



Also, sales volumes and prices offered by Russia and Cuba are governed primarily by considerations of debt servicing to western creditors and by foreign exchange requirements to pay for imports, particularly in years of bad harvests. This increase of supply must create increased problems for Ontario producers. A brighter side of the picture is that higher energy costs have improved the competitive position of Ontario nickel sulphide ores, since relatively less energy is used in refining them than is necessary for the laterite ores found in many of the new projects.

Potential future production of nickel and copper from the sea-bed in the 1980's has a distinctly adverse effect on long range planning for land-based production.

In 1975 Ontario produced about 75% of Canadian mine production of nickel and 32% of world production. "World" production in this paper refers to the non-communist world since little information is available from the USSR, China, and eastern Europe.

#### f) Copper

Copper shipments in Ontario in the period 1967-71 averaged 561 million pounds per year compared with 269 million pounds in the period 1951-55. In 1972-76 the average annual shipment was about 590 million pounds. This is characteristic of the upward trend of the past two decades. The rate of growth of the Ontario industry appears, however, to be slowing down.

From Statistics Canada data, copper values averaged 51 cents per pound in current dollars in the 1967-71 period compared with 65 cents in 1972-76. The corresponding constant dollar values were 55 cents in 1967-71 and 50 cents in 1972-76. Clearly the temporary high prices in 1974, when the average was 77 cents in current dollars, gave a misleading impression.

Ontario copper is mined mainly as a co-product in copper-zinc and copper-nickel mines. Stockpiles are at high levels throughout the world and there is little promise of price strength in the near term. The 2 million tons currently in stockpile represent about 4 months world consumption.



Another important problem with respect to copper is that of substitution when the price of copper rises. In the building industries, copper piping and tubing are being increasingly replaced by plastic and, in the electrical industry, aluminum is taking over for transmission lines and for printed circuitry in electronic applications. In the case of brass fittings, on the other hand, substitution has so far not played a significant role. Secondary copper from scrap competes with mined copper particularly when copper prices are high.

Ontario accounts for about 35% of Canadian copper shipments and 5% of world production, excluding the communist countries.

#### g) Zinc

Ontario zinc production was insignificant until 1954 but increased rapidly after 1956 as a result of the discovery of the orebodies at Manitouwadge. The Texasgulf discovery produced an even greater increase from 1967 onwards. Average production from 1967-71 was 672 million pounds per year. In 1972-76 production averaged about 820 million pounds.

Zinc prices averaged 15 cents per pound in current dollars in the 67-71 period and 30 cents in 1972-76. Corresponding values in constant (1971) dollars were 16 cents and 23 cents.

Since the start-up of Texasgulf's zinc refinery in 1972, about 40% of the zinc from Ontario mines has been processed to refined metal in Canada. 60% of Ontario's mined zinc production left the province as concentrates in 1975.

Over the next two to three decades, the world demand for zinc is projected to grow dramatically. A modest annual consumption growth of 2.5 - 3.5% will necessitate an additional 200,000 - 300,000 metric tons of refined zinc production capacity, world-wide, each year. This will require the output of 4 - 6 new mines of significant size, annually. The analysis of zinc's supply-demand relationship is a complex matter and, although it cannot be pursued here, it is discussed fully in the recently published report, "Towards a Zinc Policy for the Province of Ontario".

Ontario's inventory of known, undeveloped zinc resources is not adequate to maintain its present mined zinc production status in the world through the year 2000.



In the future, world mine capacity may be a greater bottleneck for zinc than world refinery capacity.

Ontario produces about 30% of Canadian zinc mine output and about 7% of world production.

#### h) Iron

The trend in Ontario iron ore production was steadily upwards until 1973 but in 1974, '75 and '76 fell back again. Average annual production from 1967-71 was 10.6 million tons compared with 3.2 million from 1951-55. Average production in 1972-76 was 11.6 million. A peak of 12.4 million occurred in 1973 followed by a decrease to 10.3 million in 1975 and an estimated 11.4 million in 1976.

Values, according to Statistics Canada, rose from an average of \$12 per ton in 1967-71 to about \$16 in 1972-76. In constant dollars, they would be \$13 and \$12 respectively. However, the values may be somewhat theoretical as most Ontario iron ore mines are subsidiaries of Canadian and U.S. steel companies so that sales are internal ledger adjustments. It seems safe to say, however, on this evidence that no big change in the constant dollar value per ton of iron ore produced has occurred in recent years.

There is a very low probability of establishment of new iron mines in Ontario in the next 5 to 10 years. New sources of supply for Ontario steel mills are being developed in the United States because Ontario iron ore deposits are relatively small and low grade. Ontario capital costs tend to be higher than those in the U.S., especially as the new U.S. sources will be extensions of existing mining areas. Because of remote mine locations, Ontario operating and freight costs tend to be higher. In recent years, union contract settlements in Ontario have exceeded those in the iron ore mining areas of the north-central U.S. with no offsetting increases in Ontario labour productivity.

Of particular significance to the iron ore industry is the existence of huge high-grade ore reserves, which are being developed for export, in a number of countries. Deposits of iron ore in Brazil, Liberia, Australia and the USSR are important in this regard.



Scrap iron and steel play an important role in the steel making industry as an alternative source of feed during periods of higher prices.

Several existing iron mines in Ontario are expected to close in the next 5-10 years so that it appears that this portion of the Ontario metal mining industry is due for a marked reduction in size.

Ontario in 1975 produced about 20% of Canadian and 2% of non-communist world output.

#### i) Uranium

Uranium production in Ontario commenced in 1956 and rapidly rose to a peak of 25.5 million pounds in 1959 to permit fulfillment of British and United States defence contracts. Following the completion of these contracts, output subsided to a low of 5.4 million pounds in 1968. A gradual improvement then began as interest developed in uranium for nuclear power generation. Ontario annual shipments of uranium oxide ( $U_3O_8$ ) increased fairly steadily to 8.4 million pounds in 1974, 10.6 million pounds (including some material from stockpiles) in 1975 and 8.6 million pounds in 1976. Production of uranium oxide in Ontario is expected to roughly double in the next ten years.

Uranium is the one major mineral commodity currently experiencing a significant boom due partly to higher coal and oil prices, and the resulting cost advantage of nuclear power, and partly due to the desire of consumers, especially in North America, Europe and Japan, to obtain secure fuel supplies. Prices negotiated by Ontario producers under long term contracts are not usually published but such information as is available indicates that average prices received for deliveries in 1976 were about three times the \$7 per pound that was typical of the 1967-71 period. Future prices will depend mainly on the number of new discoveries made during current world wide exploration programs and on the extent to which North American, European and Japanese utilities decide to use nuclear power. There is a distinct possibility that future long term world consumption is being overestimated.

It is worth noting that a price of \$10.50 per pound of uranium oxide in the mid-fifties was sufficient to simulate the discovery of large reserves. This is equivalent to about \$25 per pound today. It cannot be assumed that the \$40 to \$50 prices currently being paid for small quantities for early delivery are typical of future levels.



Ontario produces 80% of Canadian uranium output and about 16% of world output. About 10% of present Ontario production is consumed in Canada but domestic consumption is expected to increase fivefold in the next decade. A federal stockpile of 7,200 tons of uranium oxide is being held as a contingency reserve.

#### j) Gold

Ontario gold production maintained a fairly uniform level during the 1950's but since 1960 has dropped rapidly. Production from 1951-60 averaged 2.5 million ounces per year. By the 1967-71 period it had fallen to 1.3 million ounces and for 1972-76 again fell to 0.8 million ounces.

The gold mining industry is adjusting to a free market situation after the period of over-expansion due to the establishment in 1934 of a fixed high price of \$35 per ounce for gold. The stimulating effect is better understood when it is noted that this was equivalent in purchasing power to about \$185 per ounce in 1976 dollars or \$115 per ounce in constant 1971 dollars. During the period between the end of World War II and 1971, inflation reduced the revenue per ounce from about \$85 to \$35 in 1971 dollars but the industry received federal government assistance under the Emergency Gold Mining Assistance Act. Following the ending of a fixed gold price, the price rose sharply to a peak in December 1974 of \$140 (in 1971 dollars) and then fell back to about \$80 per ounce at the end of 1976. The price at the end of 1976 in 1976 dollars was \$130 per ounce. Future gold prices are uncertain, but, if they continue in the present range, the future of much of the Ontario gold mining industry is in doubt, if not in jeopardy.

In the short run, little relief can be expected in the form of significant price improvements. In the long run, more than 5 years into the future, it could be argued that some recovery will take place, once the current disposals of bullion by the International Monetary Fund have been completed.

Gold still remains an important reserve asset. Vast Central Bank stocks of gold bullion, representing 50 years of normal industrial consumption, overhang the market.

In 1975, Ontario produced 47% of Canadian and 2.2% of non-communist world gold output.



## k) Silver

Ontario silver production climbed in the nineteen fifties and sixties from an annual average of 5.8 million ounces in 1951-55 to a peak of 22.3 million in 1969. Production has since fallen to an estimated 15.6 million ounces in 1976. Average annual production in 1967-71 was 19.4 million ounces and in 1972-76 17.4 million. In the latter period, only about 30% of silver production came from precious metal mines. The remainder was produced as a by-product in base metal mining. The large copper-zinc mine of Texasgulf Canada Limited at Timmins is, for example, also the largest single silver producing mine in the world.

Silver prices during the 1967-71 period averaged about \$1.90 per ounce. They rose to \$6.00 in early 1974 and fell back to \$4.36 at the end of 1976. The average over the 1972-76 period was about \$3.40 per ounce. Average prices in constant 1971 dollars were \$2.06 per ounce in 1967-71 and \$2.60 in 1972-76. Thus, even after allowing for inflation, a substantial improvement occurred in average price.

Total world output of newly mined silver has varied very little year after year, (ranging between 9,200 and 9,665 metric tons during the period 1969-1975), regardless of the greatly increased price of silver. It is extremely difficult to increase total world mine output of silver significantly, even with such a price incentive, because about two-thirds of world mine output of silver arises as a by-product of base metal mining.

Silver is quite unlike other metals in one important respect. World consumption of silver, (about 14,000 tons in 1975), greatly exceeds world mine output of silver (around 10,000 tons) year after year. Silver is one of the scarcest metals. This famous "primary gap" between annual mine output and annual consumption has existed for over two decades and is still being filled by silver from other sources on the surface, such as "secondary" recovery (from scrap and melted down coins), releases from the silver bullion stocks of various governments, reductions in the silver bullion stocks of commodity exchanges, (e.g. the New York Commodity Exchange in 1975-76) and exports from India (1,350 tons in 1975) which consist of melted down "family fortune" jewellery. For example, secondary recovery of silver in the U.S.A. in 1973 represented 55% of total U.S. consumption.



However, these surface supplies of silver are dwindling and the long term price outlook is optimistic. There may, however, be a temporary lowering in the next year or so due to U.S. stockpile sales.

Since annual world consumption of silver could rise to 20,000 tons in four years' time and annual world mine output of new silver in 1980 will probably not rise very much higher than the present 10,000 tons - say 11,000 to 12,000 tons in 1980 - it is clear that there will be increasingly strong demand for the dwindling surface stocks and any Indian exports to fill the "gap" and therefore the price will (sooner or later) rise, probably quite dramatically. Ontario will benefit accordingly.

In 1975, Ontario produced 37% of Canadian silver output and 6% of world output.

#### 1) Platinum Group Metals

The platinum group metals produced in Ontario are platinum, palladium, iridium, ruthenium, rhodium and osmium. They are derived as by-products from nickel-copper refining. Over the last ten years, production has been fairly constant at about 400,000 ounces per year. The corresponding figure in the early fifties was 300,000 ounces. Average value of production was about \$90 per ounce in 1967-71 and \$125 per ounce in 1972-76. Constant dollar values would be about \$95 in 1967-71 and \$94 in 1972-76 so that the constant dollar unit value of production has been practically unchanged.

After almost 80 years of platinum group metals mine production, Ontario still has no refinery for these metals. Ontario production goes to the United Kingdom, Norway and the United States for refining. Three new refineries have been built in South Africa in the last decade - two with the assistance of Canadian financing and technology.

Ontario produces virtually all of Canada's platinum group metal output and is the world's third largest mine producer, after the USSR and South Africa.



m) Other metals

Other metals produced in Ontario are bismuth, cadmium, calcium, cobalt, lead, magnesium, selenium, tellurium and tin. However, the total value of annual production of these metals averages less than 3% of provincial metal totals and they will not be considered further in this paper.

n) Mineral Exploration in Ontario 1967-76

Ontario mineral exploration in the period 1967-71 continued to show the upward trend evident throughout the nineteen fifties and sixties. Thus, average exploration expenditures aimed at the discovery of new mines in 1967-71 were \$22 million compared with \$6 million from 1951-55. The corresponding constant (1971) dollar figures were \$10 million for 1951-55 and \$23 million for 1967-71.

A wide variety of opinions exists as to the average exploration expenditures needed to find a new mine in Ontario. Estimates for the 1967-71 period range from about \$15 million to \$30 million depending, for example, on what is defined as a "new mine". There is a good degree of agreement, however, among various analysts in government and industry who have studied the subject that 4 to 5 times as much, in constant dollars, was expended for each mine discovered in 1967-71 as was expended in 1951-55. The main reason for this is that Ontario has been quite thoroughly covered using the best exploration equipment available at any given time and new discoveries tend to require progressively more sophisticated and expensive techniques. Thus geophysics played a key role in all six discoveries leading to new mine construction that were made in Ontario in the last ten years.

The increasing costs of finding a mine in Ontario make the new trend that has become evident since 1971 even more worrisome than it might otherwise be. Average annual expenditures in 1972-76 were down to about \$15 million in constant dollars compared with \$23 million for 1967-71.



Suggestions have been made that this decline is due to the 1975-76 recession and that better times will see a resumption of the former trend. This is not supported by a study of the individual figures for 1972-76, which are:

Year	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>
Exploration expenditures (millions of constant 1971 dollars)	14.5	16.3	15.1	15.7	14.2*

\* Estimate based on diamond drilling and claim staking reports.

Thus at no time in recent years has the 1967-71 level of \$23 million been approached, in spite of the fact that 1974, for example, was a good year for Ontario mineral production.

The level of exploration activity in Ontario is an important "early warning" indication of the health of the provincial metal mining industry. Since the first step in any new mining investment is usually an exploration program, vigorous exploration promises future investment in new mines and a healthy industry. Conversely, the first sign that industry no longer finds investment opportunities attractive is likely to be cut backs in its exploration budget. According to this indicator, Ontario mining is heading for an eventual decline, unless changes are made in the investment climate. If the climate is changed, exploration in Ontario will increase in spite of the higher costs of finding a mine. Exploration costs are only a small part of total mining costs and their relative size in different geographical areas is therefore only one of many factors considered in industry decision making.

In addition to the decline in the total amount of exploration being carried out, the distribution of activity among various types of companies has changed. Analysis of returns made by exploration companies to Statistics Canada shows that in the 1968-71 period about

- 66% of the total field exploration expenditures in Ontario were made by mining companies already operating in Canada;
- 16% by companies having producing mines outside Canada; and
- 18% by exploration companies having no known connections with producing mines, i.e. the "junior mining companies".



In the 1972-75 period (1976 figures are not yet available) the corresponding figures were

- 70% (of the much smaller total figure) by mining companies already operating in Canada ;
- 24% by companies having producing mines outside Canada;
- 6% by exploration companies having no known connection with producing mines.

The above figures could be slightly in error, due to difficulties of obtaining and categorizing the data, but even so there is no doubt that the junior entrepreneurial mining industry has shrunk greatly in the last five years. The potential rewards for success in junior mining exploration have been reduced by federal tax changes to the point where investment in such high risk ventures is no longer attractive. It is unfortunate that the exploration field is being increasingly left to the major companies since junior mining exploration has contributed much needed imaginative initiative in the past and could do so again.

The disagreement between the junior mining industry and the Ontario Securities Commission regarding OSC policies on junior mine financing has received much publicity. There is no reason why a solution cannot be found with which both parties can live and a solution will no doubt be found. It is now evident that government actions and past policies have failed to recognize that the high risk exploration sector of the mining industry is a quite distinct entity which cannot survive and attract public funds under the policies and legislation which may be appropriate to the larger corporate sector of the industry. If we are to have expanded Canadian participation in the industry, legislation and policies appropriate to high risk investment must be provided both in provincial and federal tax and security legislation.

It is particularly significant that this sector of the industry provided much of the market and support for the Canadian geophysical industry which is centred in Ontario. It is a fact that our geophysicists and geophysical manufacturers are recognized as uniquely technical leaders in the world's markets today. Without the support of a vital and active Ontario exploration industry, we are in imminent danger of losing one of the only competitive manufacturing sectors of our economy.



## 0) Impact of Regulatory Agencies

There is general acceptance of the need for government regulation to ensure better standards with respect to such matters as environmental preservation, health, safety and proper use of funds raised from the public. It must be recognized, however, that the extra costs imposed on mining operations by new government standards on environmental matters, land use legislation, Workmen's Compensation Board rules, Unemployment Insurance costs, Ontario Securities Commission rules on junior companies and the total tax load represent a growing "governmental" burden. This reduces profit potential, after tax return on capital, and thus availability of investment capital for production maintenance and expansion. Care must be taken to see that this governmental burden is not made larger than absolutely necessary.

A chronic labour shortage in Northern Ontario mines hinders mineral production. Anti-Inflation Board control over wages hinders recruitment which requires attractively higher wage rates. These rates need to incorporate more than the traditional differential with rates in Southern Ontario and this is not permitted. Unemployment insurance program benefits are attractive enough to reduce motivation and mobility of the labour force and hence labour supply to Northern Ontario. The federal Foreign Investment Review Agency activities damage Canada's image as a place in which to invest in mining.

Federal, provincial and municipal permits and authorization requirements add to the lead time for new projects, thus imposing significant front-end opportunity costs. Delays may be as much as 2 years for small and 5-7 years for big projects.

Federal guidelines discourage exploration for uranium in Ontario by experienced foreign firms by permitting them only a minority equity interest in the mining of any ore-bodies discovered. This is diverting some exploration dollars away from Ontario to other countries. Uranium exploration in Canada is active in spite of these guidelines because of anticipated high uranium prices, the high grades encountered in the new areas of interest in Saskatchewan, and the need for secure fuel supplies by foreign utilities. The number of discoveries made in the next few years will show whether it is active enough.

Constant review is needed to ensure that some of these regulations are not doing more harm than good.



p) Further Processing

The policy of the Government of Ontario is that minerals produced in the Province shall be processed to as advanced a degree as is reasonably possible before being exported from Canada. An advanced degree of processing increases the income to Canada from the minerals exported and results in more skilled employment for Canadians.

This policy has been followed for over 60 years with considerable success and in recent years about 65% of Ontario nickel production, 90% of copper production and 40% of zinc production has been processed to the metal stage in Canada. Gold and silver production from precious metal mines is now fully processed in Canada. Gold and silver produced as a by-product from base metal mines is shipped as a constituent of the base metal concentrates and therefore has a similar distribution as far as processing is concerned. More iron ore is consumed by Ontario steel mills than is mined in the Province. Uranium is fully processed to the fuel form needed for reactors of Canadian design. Investment in an enrichment plant to produce fuel suitable for foreign reactors cannot be justified at this time. No Canadian refinery as yet exists for platinum group metals.

Further processing policy is implemented by two methods. Section 113 of The Mining Act provides a legal basis for the Government to insist on processing to the metal stage in Canada. The Mining Tax Act provides for tax incentives to encourage it.

From the time of the passage of the original version of Section 113 in 1917, it has been recognized that passage of a law does not automatically make economic sense out of economic nonsense and that in some cases 100% processing in Canada is not a sensible objective. Provision was therefore made for exemptions by Order in Council. Exemptions currently existing were obtained for one or more of the following reasons:

- i) Where no further processing facilities exist in Canada and the benefits obtainable appear to be too low, in relation to costs, to justify construction;
- ii) Where inadequate further processing capacity exists in Canada and funds for construction are not available at this time;



- iii) Where inadequate further processing capacity exists in Canada and ore reserves are insufficient to justify construction;
- iv) Where quantities of semi-processed material exported are too small to justify construction of a Canadian processing plant;
- v) Where the semi-processed material is not acceptable to Canadian further processors due to impurities which interfere with refining of other metals. Quantities involved are insufficient to justify modifications to Canadian plants;
- vi) Where the semi-processed material is not acceptable to Canadian further processors due to impurities causing environmental pollution. Quantities involved are insufficient to justify modifications to Canadian plants;
- vii) Where foreign customers are unwilling to accept fully processed material and able to obtain their requirements from other sources if denied Ontario supplies;
- viii) Where export of semi-processed material is necessary until new Canadian plant construction, now in progress, is completed.

Section 113 serves as a useful monitoring device and enables the Government to regularly review the situation and to ensure that as much processing as is economically feasible is carried out in Canada. The tax incentives under The Mining Tax Act are more positive and therefore more effective in that they increase the economic advantages for industry of building processing plants in this country. Additional incentives are offered for construction in Canada and especially Northern Ontario. These incentives, and particularly the increased processing allowances, have been instrumental in inducing major new investments in Northern Ontario, such as Inco's strip mill and the Texasgulf copper refinery.





